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Graham North, BSc, BEng

Contact Information:

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Summary:

Experienced Embedded Real-Time Engineer and Architect with over 20 years in the field, specializing in AI/ML applications for embedded systems. Proficient in integrating Neural Processing Units (NPU), optimizing AI/ML models for resource-constrained environments, and implementing real-time edge AI solutions. Skilled in various operating systems, software, and hardware platforms, with a proven track record in leading teams and managing complex projects focused on cybersecurity, real-time systems, and compliance with industry standards.

Technical Skills:

- **Operating Systems**: Linux (Yocto, Ubuntu, RedHat, SuSE), RTOS (PikeOS, FreeRTOS, Zephyr), Unix (AIX, Solaris), Embedded Linux, Windows (Server, Desktop).
- **Software**: C/C++, Python, Java, Bash, Embedded Systems, Linux Kernel Development, Driver Development, TensorFlow Lite, OpenEmbedded (OE), Yocto Project, Docker, Kubernetes, Git, Machine Learning Model Optimization, Secure Boot Development.
- **Hardware**: ARM (Cortex-A, Cortex-M, Cortex-R), NXP i.MX Series (i.MX 6, i.MX 8M Plus), NVIDIA Jetson, Intel (Core/Xeon), FPGA (Xilinx, Altera), JTAG, MRAM, PIC (16FXXX), Neural Processing Units (NPU), Data Processing Units (DPU), Raspberry Pi, Edge AI Accelerators.
- **Management**: Team leadership, agile project management, task allocation, performance assessment, recruitment, cross-functional team collaboration, and resource planning.

Professional Experience:

AI Kernel/Embedded Engineer | Linaro

July 2024 - current

- Developed a bootloader and Linux kernel with Execute-In-Place (XIP) to optimize size and boot speed, integrating AI capabilities on ARM Cortex-A SoC architecture.
- Customized u-boot and kernel for minimal ROM/RAM usage, utilizing ARM Trust Firmware for secure boot and supporting AI/ML model execution in resource-constrained environments.
- Created tailored OpenEmbedded recipes within Yocto-based Linux, assembling a minimal Linux environment optimized for embedded AI applications.
- Conducted simulator-based testing and debugging using RTL pre-silicon simulators, validating AI functionality and system performance before hardware deployment.
- Enabled XIP for u-boot and Linux kernel with NOR/MRAM, allowing efficient AI model execution on embedded hardware and ensuring seamless integration across system components for a secure, AI-ready solution.

MoD SC Cleared Senior Embedded Real-Time AI Engineer/Architect | MBDA

December 2023 - July 2024

- Developed embedded software for missile guidance systems using Embedded C, integrating with Texas Instruments SoCs and NXP i.MX 6 processors for real-time performance.
- Utilized PikeOS RTOS to implement a secure separation microkernel architecture, meeting stringent safety and security standards in defense applications.
- Implemented ARM TrustZone technology on NXP i.MX 6 platforms, enhancing cybersecurity protection for critical software components in mission-critical environments.
- Conducted a research project on the NXP i.MX 8M Plus processor, focusing on its Neural Processing Unit (NPU) for AI/ML applications, including computer vision and Industry 4.0 use cases.
- Adhered to MISRA C guidelines, DO-178, and IEC 61508 safety standards, ensuring compliance and reliability in safety-critical software development.
- Collaborated with hardware teams for seamless SoC integration and used IBM Rational Team Concert for effective project management.

Principle Embedded Real-Time Engineer/Architect | Turbo Electric

October 2018 - Present

- Led the development of EV charging systems with a focus on AI-driven V2G technology.
- Ensured compliance with IEC 61508 and ISO 26262 standards.
- Integrated AI and machine learning models to enhance system efficiency.

Linux Real-Time System Engineer/Architect | Campus Society/Connectt

July 2018 - October 2018

- Transitioned the platform from a monolithic architecture to a microservices-based cloud architecture.
- Implemented continuous deployment strategies using Terraform and BASH scripting.

Linux System Engineer/Architect | QuintilesIMS

May 2017 - March 2018

- Automated software deployment processes, increasing platform stability.
- Provided continuous support and project management using Jira and Confluence.

Linux Technical Engineer/Architect | Secret Escapes

February 2017 - April 2017

- Automated build/test processes and optimized storage infrastructure.
- Addressed platform issues to enhance system performance and reliability.

Real-Time Technical Engineer/Architect | Home Office

May 2016 - November 2016

- Integrated legacy platforms into new deployment environments.
- Developed network monitoring tools and managed workflow using Scrum/SAFe methodologies.

Real-Time Platform Engineer/Network Architect | CenturyLink

February 2013 - January 2016

- Designed real-time monitoring platforms and provided customer-facing technical support.
- Managed a team to optimize real-time applications and increase system efficiency.

Education:

- **BSc in Computer Science** - Lancaster University
  1995 - 1998

- **BEng in Electronic/Mechanical Engineering** - University of Central Lancashire
  1990 - 1993

Certifications:

- MoD SC Cleared